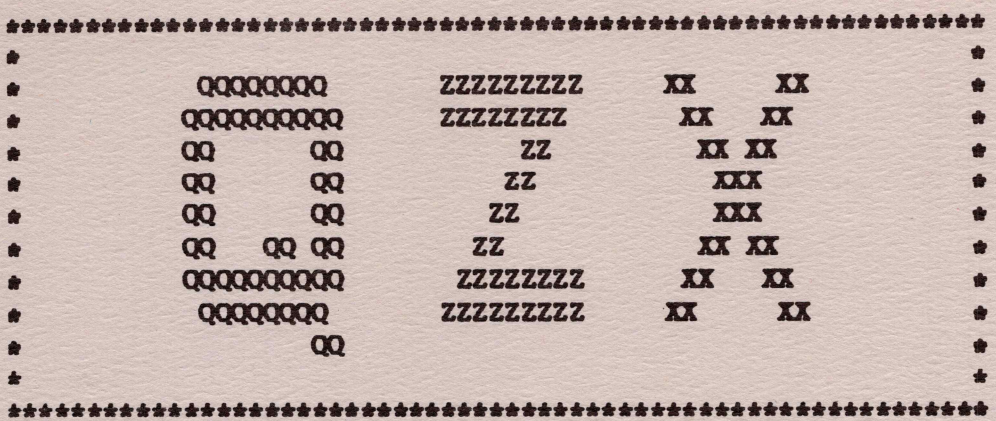
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QQ

*The Journal Covering Amateur Radio & Sinclair Computers*
*ZX-80; Micro-Ace; ZX81; T/S 1000, 1500, & 2068; QL*
*2025 O'Donnell Drive*
*Las Cruces, New Mexico*
*88001*

*K5XY*
*Alex. F. Burr*
*Publisher*

*W4GHV*
*Bo Barry*
*Editor*

*Volume 4 Number 10* *($1.50-issue)* *September 1986*

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## PUBLISHER'S NOTES

Bo's moving certainly has complicated things a bit, but they are gradually getting straightened out. The last issue was listed as the July-August issue in an attempt to get more up-to-date. Nobody will be shorted an issue however. Every subscription which expired after July 1986 was extended by one month so you will still get twelve issues. Your expiration date in the upper right hand corner of your mailing label should reflect this change.

The bulletin boards available to QZX readers have been changed. Bo's Teachers Pet board has moved to North Carolina with him. The new telephone number is (704)547-4185. It is still 300/1200 baud, but it is no longer available 24 hours a day. It is open from 5PM-9AM M-F, plus all hours on weekends. Call it other hours and you will land up TALKING to Bo, this is his office phone! It is still a FIDO board, net 18 node 9.

The main QZX board is still in Las Cruces. The new telephone number is (505)522-7081. It is open 24 hours a day and is also a FIDO board, net 15 node 6 with 300/1200/2400 baud available. The Sinclair file area is number 18. There you will continue to find advanced files of QZX articles prepared for future issues. You can also leave messages for me either via the FIDO net system or directly in message area 1. Address them to ALEX BURR. THe board operates like any standard FIDO board, just as was detailed in the November 1985 issue of QZX.

## Editor's Comments - W4GHV

Alex and I will get things re-synchronized soon! I moved 12,000 lbs from a home in NM into a 2 bedroom apartment (plus an expensive storage facility). I apologize for the unanswered letters, they will get answered when/if they re-surface!

The recent loss of my 17 year old son, Michael, has been a bit difficult to accept, but I hope to at least go back to work soon.

I did manage to get on packet here. A new Kenwood TR-2600A made the job a lot easier. I was about ready to put the old Icom IC-22S in the trash when I saw an article on changing the crystal to get it down to 145 MHz. So, I'll continue chasing the intermittents (steel feed-thru pins) until it operates reliably, and then will convert it for packet use. The packet activity is strong here and once I figure it out, I should be able to 'link or gateway' all over the place like Alex is doing. I can be reached via the KK4L packet BBS in Charlotte, NC.

## The QL on Packet
K5XY

The QL has been on packet and very successfully too. There was not a lot of work to it either, but an additional accessory was used. I have been so busy making my packets cross half the state of New Mexico, all of the state of Arizona, and into California that I cannot give a definitive report on the QL and packet, but I can tell you what works.

I will not review the QL either. I have not looked at it closely and other reviews exist (see also earlier QZX's), but I can tell you a bit about the features of the QL that worried me before I used it.

The first of these features is the keyboard. The keyboard on Sinclair computers is the most frequently replaced item, not because they broke but because they were hard to use. I wrote a previous review of the QL keyboard for QZX after I had used one for a little while in London. That review still holds after I have used one more extensively. There I said the biggest difficulty was the L shaped RETURN key. When you hit it on either end it tended to bind a little bit. However this is the best keyboard Sinclair has ever made, and this little difficulty is really small because you rarely hit the key at either end even if you are a poor touch typist as I am.

The keyboard does not have a 10 key number pad, an addition most hams will not miss. There are a number of useful extra keys including five function keys, an alternate key, and a caps lock toggle key which does not have an indicator light. The symbols are for the most part conventionally located. Even such often overlooked ASCII characters as the backslash and vertical bar have their own labeled keys. Of course, there is a pound sign too (but also a dollar sign). The arrow keys are located on either side of the space bar and operate in a manner a bit different than most American software. The control and alternate keys multiply the special functions available from the function keys.

The microdrives are the next possible difficulty. They are not disk drives. For one thing they are smaller. The microcassettes are easier to handle too. However they are slower and hold only 100K of information. There are two overwhelming considerations. They work and they are inexpensive. I had no trouble with them while on packet. The microdrives are not used much by the typical program because the program is completely loaded into memory if

it will fit. There it is accessible rapidly.

The monitor was another item of concern. Because the monitor I am using is the Sinclair monitor, I had no worries about compatibility. Because it is a RGB monitor, I had no worries about the quality of the color pictures either. But I did wonder if the packets would be easily readable on the screen. They were.

The terminal program presented them as green words (ink) on a black background (paper). This combination can be easily changed, but I felt no need to do so. The character set is clear, unambiguous, and well designed. The screen is much easier to read than the Apple IIe for example.

The accessory used to connect the QL to the MFJ TNC is called the MODAPTOR and is designed to be used with the QCODE terminal emulator. This combination of hardware and software comes from Great Britain and is available at such places as Quantum Computing (see ad in this issue) for about $46.

The MODAPTOR is a little black box with two slide switches with a cable with a nine pin plug on one end which fits into a socket on the QL and a cable with a 25 pin plug on the other end which fits into the TNC. This equipment is essential for use in Great Britain where thy have such interesting conventions as services which operate at 1200 baud in one direction and 75 baud in the other. I do not yet know if the box is necessary for packet work here. There are rumors that the timing on the RS232 signals from the QL is a bit erratic and this equipment cures that problem. But I have been too busy sending packets to notice what the signals look like. Just as soon as I find time to make up my own boxless connection cable, I will check out the direct interconnection. In the meantime this arrangement works and the plugs on the adapter are high quality plugs.

The QCODE software is completely adequate for packet work. It contains lots of features which will be very useful in Great Britain but which will not be used here. The software does make the QL look like a VT52 terminal which is fine for the TNC.

The first thing the program asks you to do is to make a back up of the original tape. The original tape even includes a short program called CLONE to help you do that. Follow their advice.

The mimeographed instructions are full of details of Prestel, Micronet, and Viewdata which are not available here. But you can easily enter a menu and customize it for packet use. There is even a command which lets you save the menu changes you have made so that the next time you load the program you will not have to remake the changes.

I have not yet used the file transmission capabilities nor saved incoming packets to a file although that capability is available. There is even a small file editor program included with the terminal program. Four different canned messages can be prepared. I used them to provide a rapid connection to myself through our wide area digipeater, to provide a connection to the local bulletin board station, and to send a short description of my packet station. The description is short because the canned messages are limited to 80 characters each maximum.

The program does not offer split screen capabilities although the QL operating system would seem to make this refinement easy to implement. This addition will be studied later.

Anytime I run a new program on new equipment, I always proceed slowly and nervously. I am afraid that something will not work and I am usually right. This set up did not prove to be an exception. After working through the initial menu, I was confronted with a black blank screen. Nothing would put any characters on it. The list of things that could have gone wrong was endless; the computer could have cratered, the software could have had a bug. Perhaps the tape was defective. Maybe the cable had a broken wire. However just turning the TNC on cleared up all these problems. Unfortunately the output of the TNC while appearing on the screen was garbled. Fortunately setting the correct data rate cured this problem. Unfortunately ... and so it went. When all the operator caused problems were corrected, things worked fine.

There still was an occasional garble on the screen however. After a while a pattern began to emerge and the solution presented itself. It turns out that my set up needed about 10 NULLS after each line feed to insure correct printing to the screen. The TNC easily provided these NULLS. This solution worked but was not optimized. The optimization is a project to be reported later.

The bottom line is that the QL works fine on packet. My equipment consists of a QL with a Sinclair RGB monitor feeding an MFJ TNC through a MODAPTOR. The TNC sent the signal to a Yaesu HT connected to a 1/4 wave mag mount antenna set on top of a book case in the family room. This equipment provided enough signal to reach our wide area digipeater 60 miles north of town from which my packets could cover a large amount of territory. In all a very satisfactory and

inexpensive packet system.

## MC To DATA
D. C. Alford

Here is a program which appeared in the June issue of the newsletter of the Hampton Roads T/S Users Group which takes a machine code program from the T/S 2068 and converts it into DATA statements for easy manipulation.

I have converted a Spectrum program by Bill McIntosh which appeared in the Feb/Mar 1986 issue of ZX COMPUTING to work on the 2068. This program will take your machine code program from memory and put it into the basic program area complete with line numbers as DATA statements ready for printing, saving, or editing.

The program starts by taking the end address you specify and transfers the data into lines starting with line 9998 and working backwards until it reaches the start address you specified. The program accomplishes this by using an LDIR so do not try to run the code from its old location without first repoking it back into that location. The data can be repoked into its old location by changing the 65000 in line 5 of the HEX LOADER to your start address.

After typing in the main program, RUN it and wait for the OUT OF DATA message. SAVE the program CODE with SAVE "datacreate" CODE 65000,216.

Load in your machine code program and the "datacreate" CODE saved above. The start address of the code you wish to convert should be POKED into 65000 and 65001 and the end address of the last byte should be POKED into 65002 and 65003 using program 2 below.

```
    1 REM datacreate
    5 LET X=65000:LET A=10:LET B=11:LET C=12
    6 LET D=13:LET E=14:LET F=15
   10 READ A$
   20 FOR N=1 TO 15 STEP 2
   30 LET W=VAL A$(N)
   40 LET W=W*16:LET W=W+VAL A$(N+1)
   50 POKE X,W:LET X=X+1
   60 NEXT N
   70 GO TO 10
   80 STOP
 9972 DATA "00000000210E2722"
 9973 DATA "9FFE2AEAFDED5BE8"
 9974 DATA "FDB7ED527DE60728"
 9975 DATA "0E2AEAFD7DE6F86F"
 9976 DATA "1108001922EAFD2A"
 9977 DATA "EAFD2822EAFDED5B"
 9978 DATA "E8FDB7ED5222A1FE"
 9979 DATA "21BCFE22A5FE3E08"
 9980 DATA "32A3FE2AEAFD2B22"
 9981 DATA "EAFD237E219EFE77"
 9982 DATA "AFED6F47ED6F4FED"
 9983 DATA "6F79FE0A3803C607"
 9984 DATA "4F78FE0A3803C607"
 9985 DATA "472AA5FE79C63077"
 9986 DATA "2B78C630772B22A5"
 9987 DATA "FE21A3FE3520C421"
 9988 DATA "5668011800CDBB12"
 9989 DATA "2A9FFE2B229FFE23"
 9990 DATA "EB21A7FE7223732B"
 9991 DATA "115668011800EDB0"
 9992 DATA "2AA1FE110800B7ED"
 9993 DATA "52D21DFE21C80011"
 9994 DATA "C800CDF303C90000"
 9995 DATA "0000000000000000"
 9996 DATA "001400E422000000"
 9997 DATA "0000000000000000"
 9998 DATA "0000000000220D00"
 9999 REM RANDOMIZE USR 65004
```

```
    1 LOAD ""CODE 65000,220
    5 INPUT "START ADDRESS",X
   20 POKE 65000,X-256*INT (X/256)
   30 POKE 65001,INT (X/256)
   31 CLEAR X-1
   35 INPUT "END ADDRESS",Y
   50 POKE 65002,Y-256*INT (Y/256)
   60 POKE 65003,INT (Y/256)
   65 PRINT #1;"NOW HIT ENTER,RUN&ENTER;
   66 PAUSE 0
   70 DELETE 1,80
 9999 RANDOMIZE USR 65004
```

## QZX FRIENDS

W1MDZ -- Stan was out of his state for a while and could not renew. He recently did so and requested back issues. We were able to supply all those for the past fourteen months.

WB0QPI -- We want to welcome back Lloyd too. He was able to resubscribe after a lapse of time.

K2ZFV -- Van has a T/S 1000 and a T/S 1500. He has gotten his Westridge 2050 modem hooked up and running and is looking to start using it some more.

W4FCJ -- Smithy says that he enjoys the packet articles. He said that WA9ESX, who wrote the RTTY article in the January QZX, gave his some special help in loading NU4V's NRAP program on a Hunter board. At present he is using a T/S 2040 printer but would like some help in locating a Brother EP44 or similar serial printer.

NU6F -- Ron has several T/S 1000's and his original ZX81 kit with homebrew EPROM programmer, memory, and centronics interface. He is looking for anyone with instructions (in English) for the G1FTU RTTY program for the Spectrum. The one he got had instructions in Swedish! Drop him a line if you have instructions in English. Address ok

in callbook or call collect (408)259-5734.

WB0QPI -- Lloyd is putting either his Z8-81, T/S 1000, or T/S 1500 on packet. He also asked about attaching a monitor to the T/S 1500. (For our answer see the articles.)

KA0SOH -- Don has recently obtained a Westridge 2050 modem purchased from Zebra. Works great. That and my Byte Back 64 K RAM give me a lot of BBS power. All that I need. Using one T/S 1000 for BBS activity. Using the other with Kenwood TS 820 to RTTY and CW.

NR0T -- Rolf says that he is now on the air with ZX81, 64K Memopak RAM, Comlink I, MFJ TNC-2, AZden PCS 5000, and Hygain V2-S colinear antenna.

## EQUIPMENT SPECIALS

This is a occasional column in which we will list some of the equipment in which we think our readers will be especially interested or which appear to be special bargains. If you have suggestions for items to appear here send them in. If you have comments on the items which appear here send them in too. The information here is as accurate and as complete as we can make it, but is listed here only as an indication as to what might be available. Any decision to purchase should only be made after further investigation.

| ITEM | COMMENTS | $ | ID |
|---|---|---|---|
| ZX81 | Computer only | $20 | HT |
| ZX81 | AS-IS some need work | $10 | ZS |
| WC2050 | untested modem board | $10 | ZS |
| RS232 | conversion kit for above | $20 | ZS |
| WC2050 | complete warranted | $70 | ZS |
| MTERM II | for T/S 2068 | $30 | ZS |
| | advanced terminal software | | EB |
| Above | in cartridge form | $35 | ZS |
| The Complete Guide to MTERM II | | $ 7 | B.C. |
| | Booklet on MTERM II | | |
| TS2068 | extra software inc | $99 | SE |
| TS1500 | complete | $50 | SE |
| Spectrum accessories | | | EC |
| Keyboard kit for ZX81 etc | | $15 | EB |
| Computer Repair | | varies | SE |
| EPROM | ZX80 to ZX81 almost | ? | GR |
| I/O for all Sinclairs | | $70 | WO |
| QL hardware and software | | varies | QC |

| ID | Addresses |
|---|---|
| HT | Hal-Tronix, Inc.<br>Box 1101 Dept QZX<br>Southgate, MI 48195<br>(313) 285-1782 |
| ZS | Zebra Systems<br>78-06 Jamaica Ave. Dept QZX<br>Woodhaven, NY 11421<br>(718) 296-2385 |
| SE | Sunset Electronics<br>2254 Taraval Street Dept QZX<br>San Francisco, CA 94116<br>(415) 665-8330 |
| EB | E. Arthur Brown Co.<br>3404 Pawnee Drive Dept QZX<br>Alexandria, MN 56308<br>(612) 762-8847 |
| EC | English Micro Connection<br>15 Kilburn Court Dept QZX<br>Newport, RI 02840<br>(401) 849-3805 |
| BC | Barry Carter<br>Box 614 Dept QZX<br>Warren, MI 48090 |
| GR | G. Russell Electronics<br>RD1 Box 539 Dept QZX<br>Centre Hall, PA 16828<br>(814) 364-1325 |
| WO | Thomas B. Woods<br>Box 64 Dept QZX<br>Jefferson, NH 03583 |
| QC | Quantum Computing<br>Box 1280 Dept QZX<br>Dover, NJ 07801<br>(201) 328-8846 |

## BITS AND BYTES

86. When using the canned messages in Comlink I on packet, start each group of words with a new line number rather than put the whole message in one REM statement. It is then much easier to make small changes in things like equipment lists without having to space through the whole message to the part you want to change.

87. Z-XLR8 will work with the T/S 1500 (in most cases) by simply reversing the leads in the input (ear) cable, or by using an inverting preconditioner.

88. The 64K memopak RAM will work with the Comlink I packet interface only in MODE D which does not use addresses 8000-16K. This mode cuts down the memory to 48K.

## UNCLASSIFIED ADS

WANTED: UNCLASSIFIED ADS for publication in QZX. Cost is 1 cent for each keystroke (characters, blanks, etc.). Payment must be included with order. This is an excellent way to sell your program or unwanted equipment, ask for help, or find a specific program. Send your ad with payment to QZX, 2025 O'Donnell, Las Cruces, NM 88001.

WANTED: TNC and/or TU for T/S 1000 to Kenwood TS820. Call Don, (314) 832-7434, Mornings.

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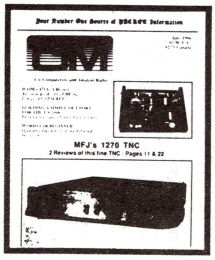


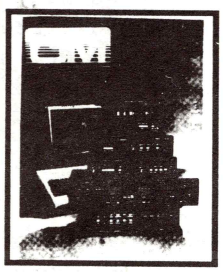

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DATE _____

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# THE "RAMbo" RESCUE . . . !

by LU8MAD, Guillermo

This projet fulfil the same functions as the HUNTER Board but inside of computer with two chips..! (and less $10.-)

This is a version II of THE GREAT RAM RESCUE (R. Glidden,SYNC) on recovering the built in 2K TS-1000 memory (Address 8192 to 10239). According to Glidden:"so, do those of you who have upgraded your ZX81 /TS1000 to 16 K ever feel sorry for that unused 1K-2K RAM, sitting unloved and unneeded inside your computer? Why not put it to work for you by wiring together this little circuit ?. It will, convert your on-board RAM into a handly little place to put machine code programs...Here,nestled away, will be a memory location unaffected by LOAD, NEW and MC induced crashes."

I had done this projet on my computer TS1000 (issue 3), and this work fine, but now is time of uprating this for use from the address 8192 to 16383...with 8K..!

Glidden continues:"to free up some of this wasted space all you have to do is put ROM CS high whenever some of these addresses are needed, thus "turning off" the ROM in the same way a RAM pack turns off the internal RAM...";and after said " what you have after all this your on-board RAM chip selected and your ROM deactivated whenever memory locations 8192 - 16383 or 40960 - 49151 are addressed you have decoded a lot more memory area than you need for your 1K-2K RAM chip..".

This is the business...I had put a HM 6264 P-15 (CMOS Low Power) 8K Static RAM in place of the on-board RAM (4016 or 2116).

## WIRE THE CIRCUIT

Following the circuit diagram (Figures 2 & 6), make the appropiate connections to the 74LS27 ($.29). This is best accomplished by making them directly to the DIP socket.
Match up the locations of the appropiate holes (PCB feed throughs) on the board as shown in Figure 1. (issues 1 & 3).
Once you have located all the holes, make sure are correct by checking continuity between the holes and the appropiate pin of the card edge that is available at the port.That port is located at the back of the computer,provides access to all of the lines from the microprocessor. (Also look the pinout diagram in your User Manual).
Then solder the appropiate wires from 74LS27 to HM6264 and board.
Remove the RAM chip from socket by carefully prying up each end.

One variation in some issues is the omission of sockets for the RAM, which is a pity, as it makes modification in this area more difficult.

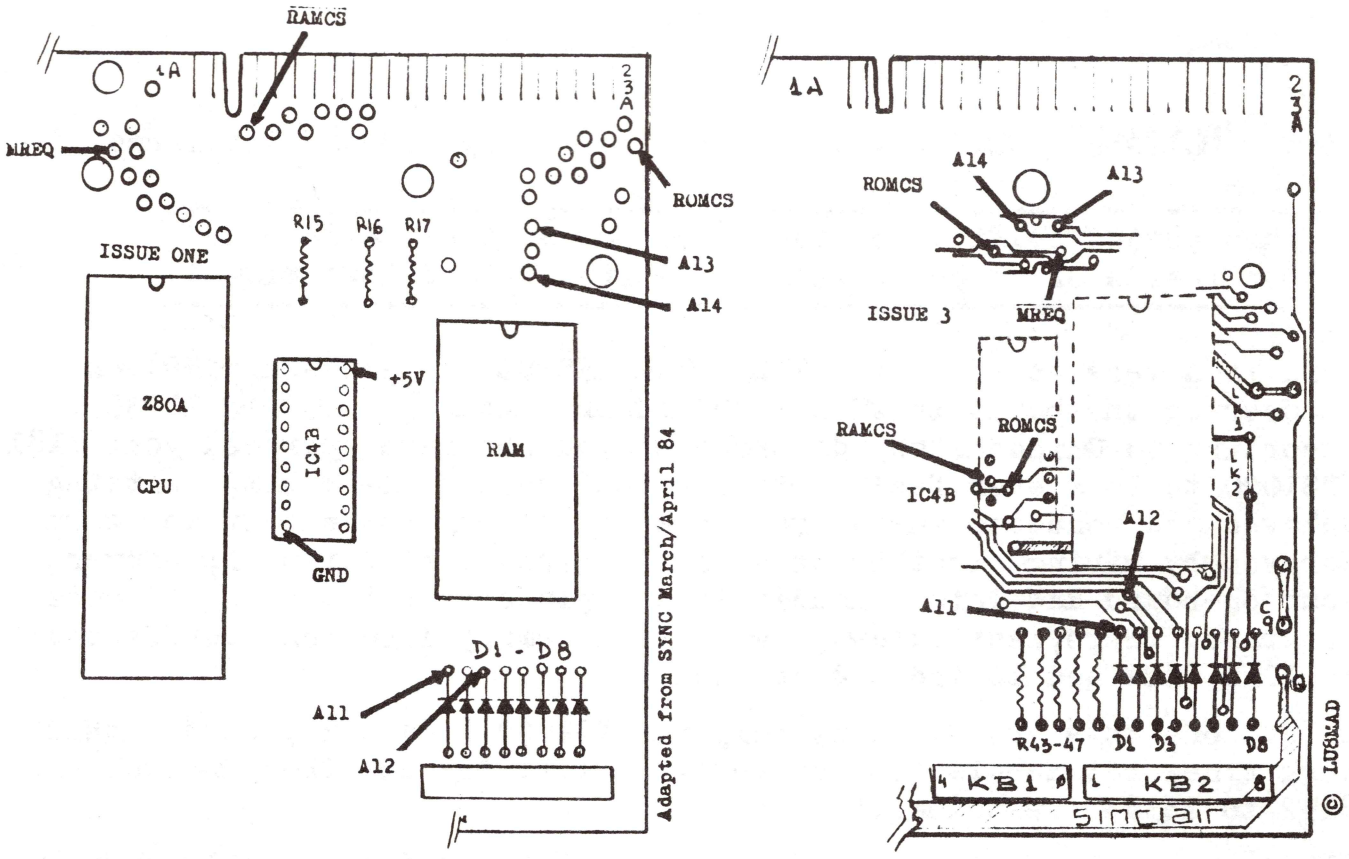


Fig. 1

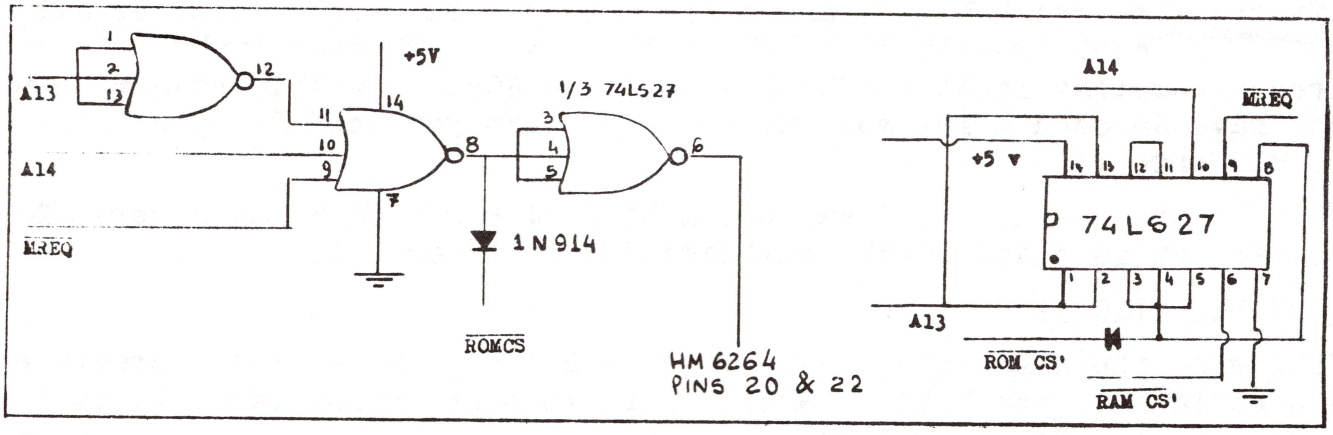


Fig. 2

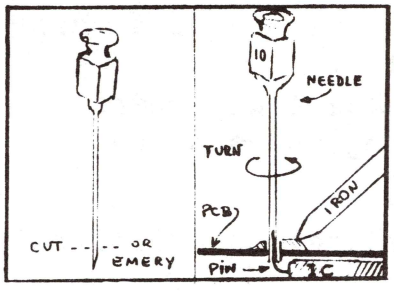


Fig. 3

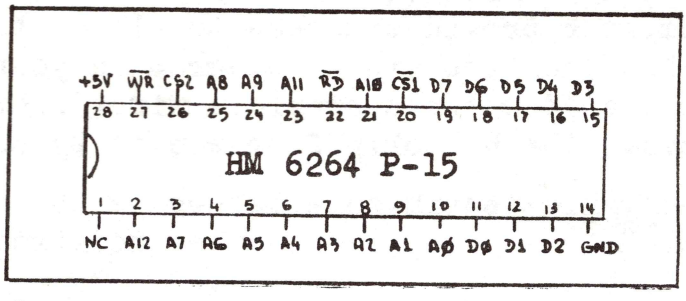


Fig. 4

The big bugbear in any internal RAM change is the need to remove existing RAM from the circuit board, unless a chip socket is provided. The correct approach is to clear the solder from each pin in turn, using a "solder sucker", but that is not the only option.

I use a hypodermic needle #10 and"pencil" soldering iron (Figure 3 ) When solder solidify turn the needle. This needle, isolate pin to the metallic hole on the board (solder not join on needle). This is the more inexpensive desoldering tool !

All the surplus solder needs to be cleared away to allow a 28-pin DIP socket to be inserted.

Carefully bend out pins # 2, # 20, # 22,& # 23 of HM 6264.You can avoid bend out pins 20 & 22 if cut trace (solder side) of PC board TS 1000 issue 3 at location of pin 8 in IC 4B. By this way trace that to come of pins 20 & 22 (IC 4A) is isolated to another components of computer. Then you can solder in hole of pin 8 (IC4B) wire of connections with pin 6 of 74LS27. (This option is valid only in issue 3 PCB).

Place one HM6264 ($7.75) in the socket with the bent out pins sticking out sideway. The HM6264 is a CMOS chip; this means be very careful with it (avoid touching the pins with your fingers).

Now look at the Figure 1. Once you have located D1 (A11) and D3 (A12), make the connections to pins # 2 and # 23.

Affix the 74LS27 to the board, upside down, using double-side tape or a small dab of rubber cement RTV.

TESTING

Now you have with the Timex/Sinclair 1000 and the 16K RAM pack, a 32K system...(8K of ROM, 16K RAM, and 8K CMOS RAM of memory that can be used to store machine-language subroutines and expand the operating system of the computer).

Enter this program to test it:

```
10 FOR A = 8192 TO 16383
20 POKE A, Ø
30 NEXT A
```

This will POKE zeros into each memory location. Then entre NEW, and the following program:

```
10 FOR A = 8192 TO 16383
20 PRINT A;", ";PEEK A;" ";
30 IF PEEK 16442 > 4 THEN GOTO 5Ø
40 CLS
50 NEXT A
```

This program verify by means of PRINT-PEEKing each byte.
You should get the entire 8K block between 8192 to 16383 full of zeros...

If you wish to learn more about transparent CMOS memory and programming, the Hunter article (see bibliography), may be helpful.

I had done this 8K (8192-16383) battery-backed-up non volatile memory (with Litium coin cell & 74LS125), but it is another business...(see the next month, at same time, on this channel QZX-TV...He..He...)

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- THE GREAT RAM RESCUE, Randall S. GLIDDEN
  SYNC March / April 1984, pg 64-67
- EXPAND YOUR TIMEX/SINCLAIR OPERATING SYSTEM, Paul W.W. HUNTER
  PART 2, RADIO-ELECTRONICS, August 1983, pg 83-91
  (very useful software)


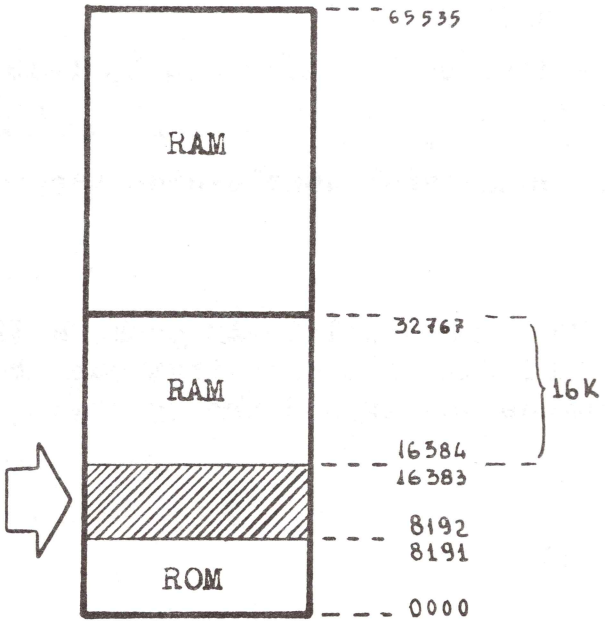


Fig. 5

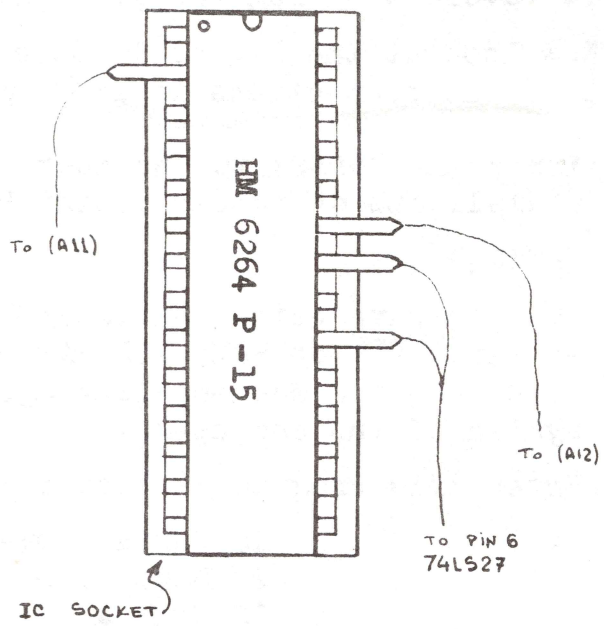


Fig. 6

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